What We Think We Know About CIRs/SIRs

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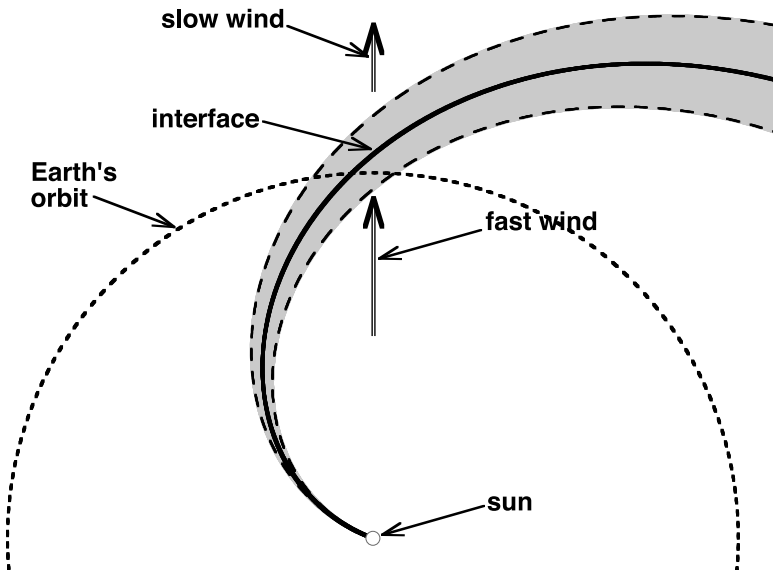
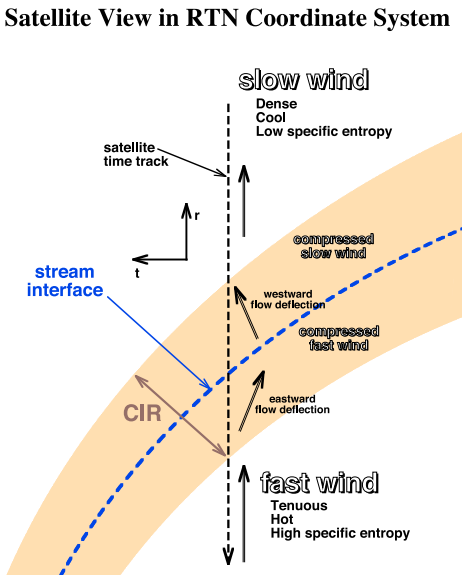
What is a CIR? A Schematic View



From:

Borovsky & Denton, 2010.

What is a CIR? A Schematic View



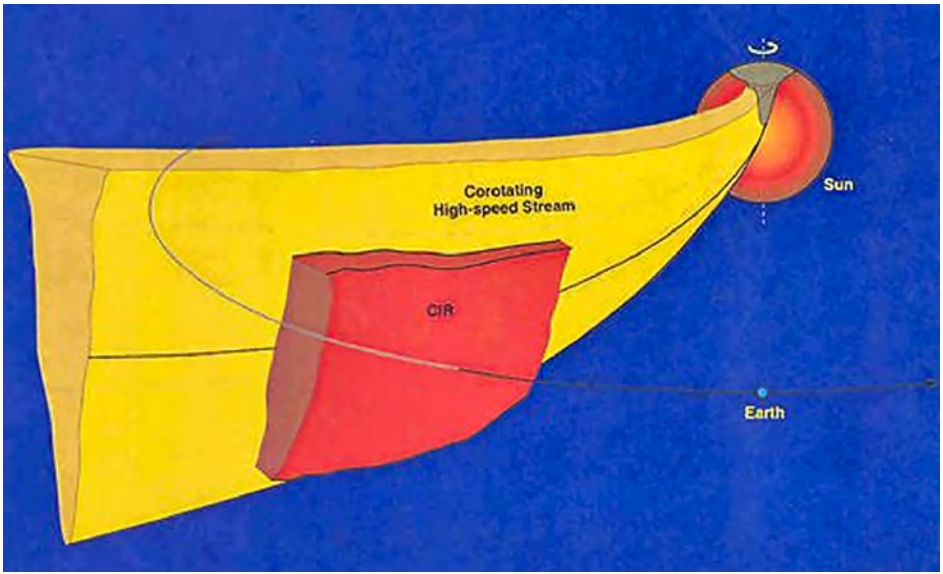
From:

Borovsky & Denton, 2010.

What is a CIR?
What is an SIR?

- Is an SIR a rapidly evolving CIR?
- Or is a CIR a steady-state SIR?
- Does it matter?

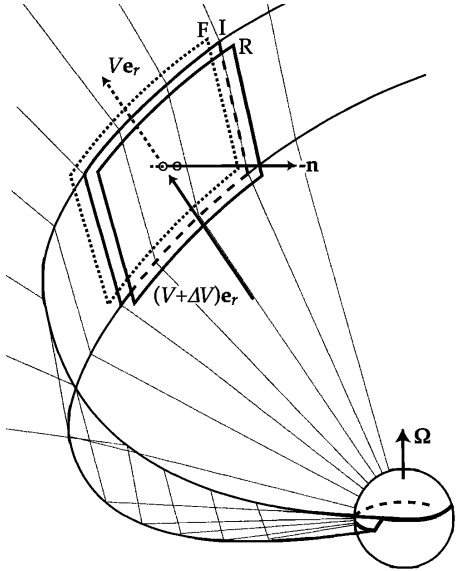
What is a CIR? An "Artist's" View



From:

Tsurutani et al., 2006.

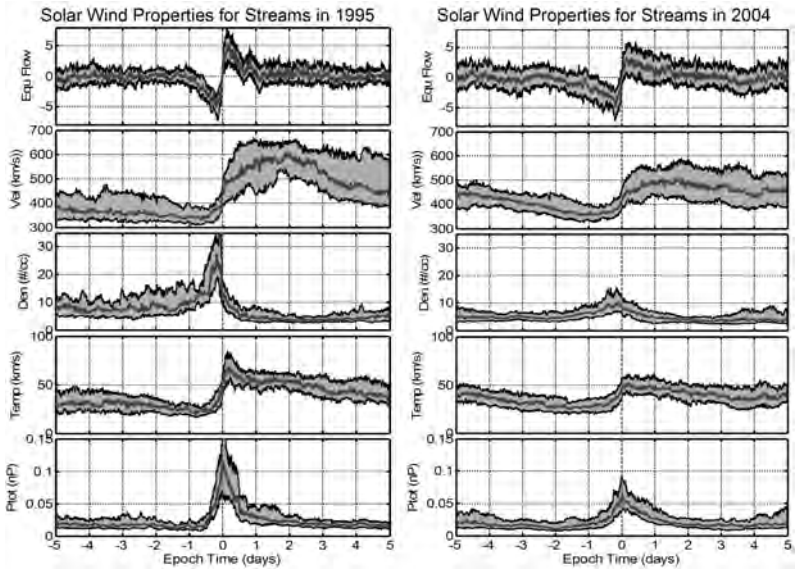
What is a CIR? An Analytical View



From:

Lee, 2000.

What is a CIR? The In-Situ View



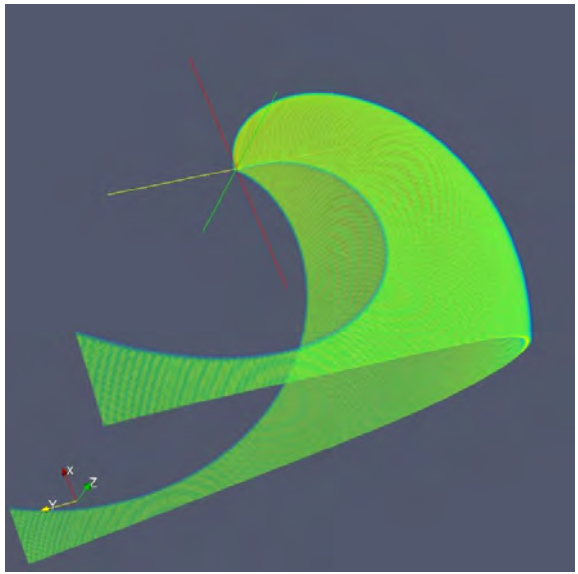
From:
McPherson &
Weygand, 2006.

What is a CIR? White-Light View

From:

Wood et al., 2010.

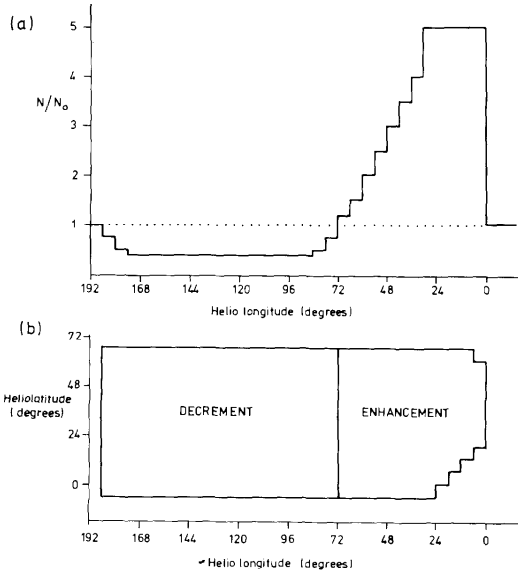
What is a CIR? Reconstruction from White Light



From:

Wood et al., 2010.

What is a CIR? Reconstruction from IPS



From:

Tappin et al., 1984.

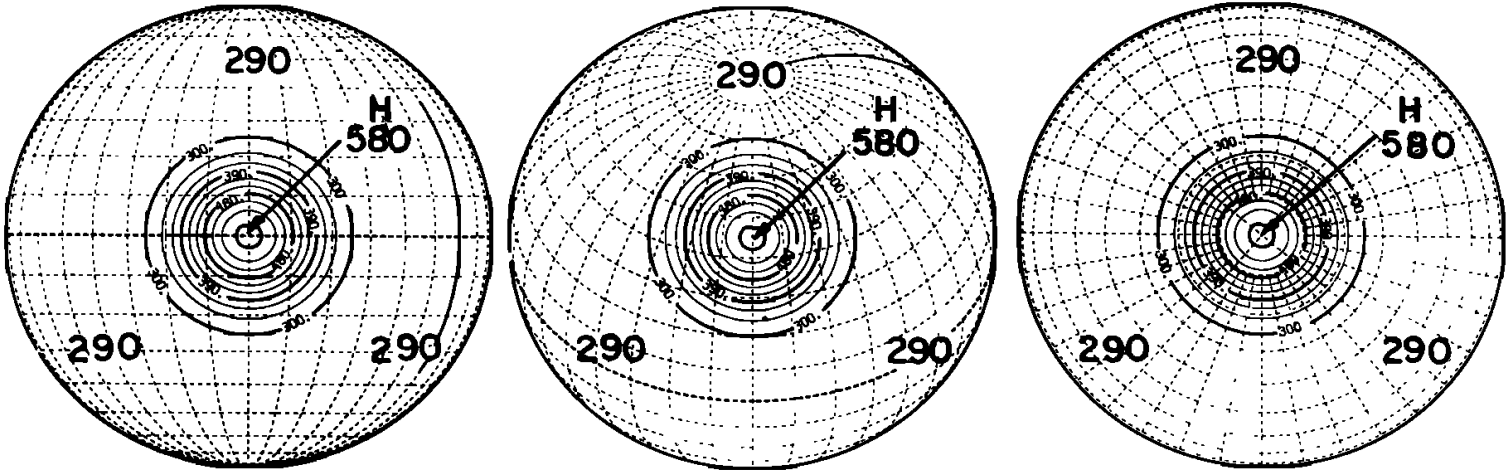
The Observational 'How'

- Much more can be said about CIRs
  - deflections in solar wind flow direction at the stream interface
  - formation and orientation of shock fronts
- Most of what we know has been learned from in-situ measurements
- A recent, thorough review can be found in Richardson [LRSP, 2018]

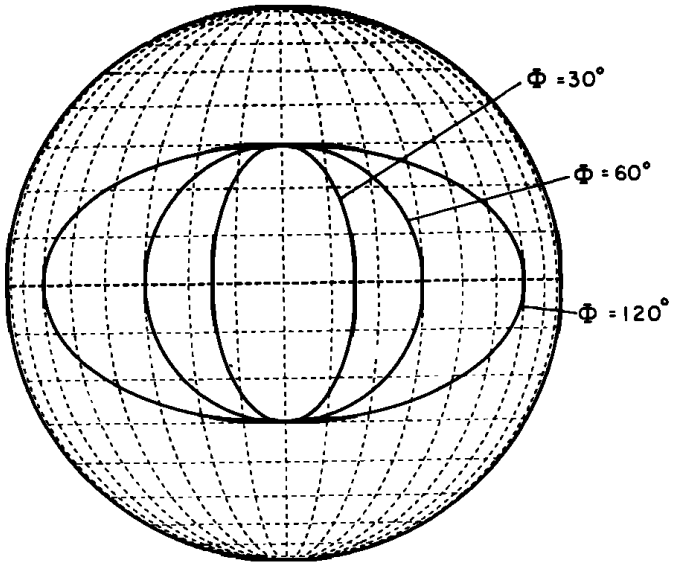
The Observational 'How'

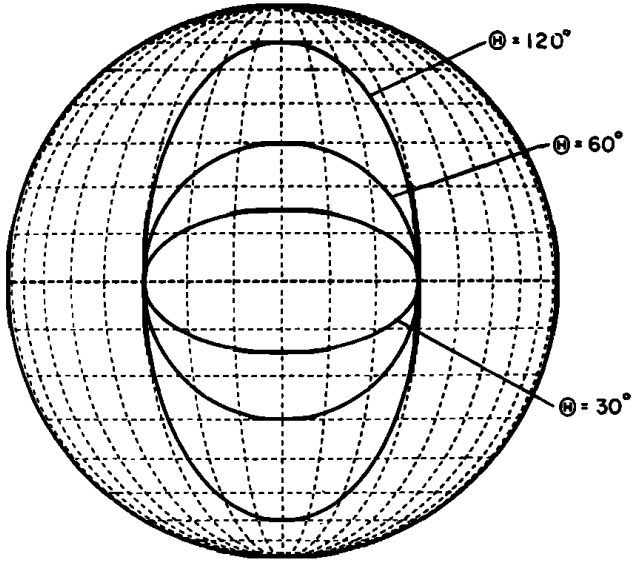
- PUNCH will use remote sensing
- PUNCH will measure scattered brightness from line-of-sight integrated mass
- PUNCH observations will be used to reconstruct the 3D structure of CIRs

Simple, Ideal Coronal Holes



Simple, Ideal Coronal Holes





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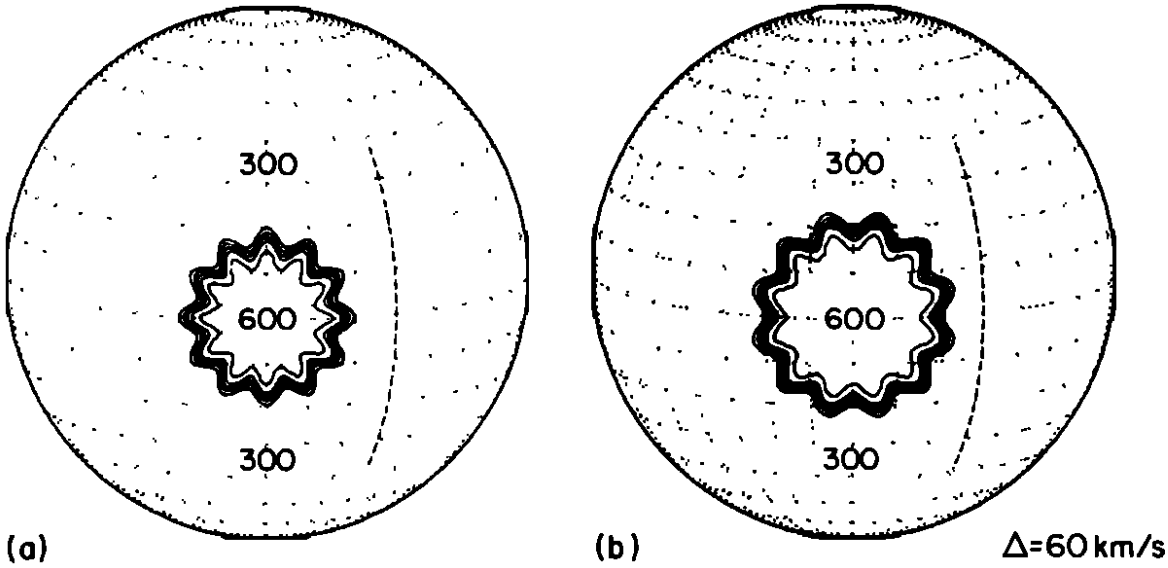

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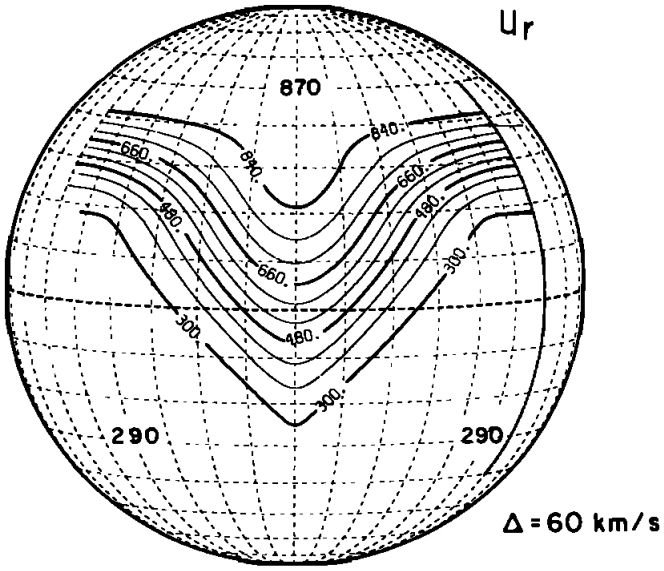
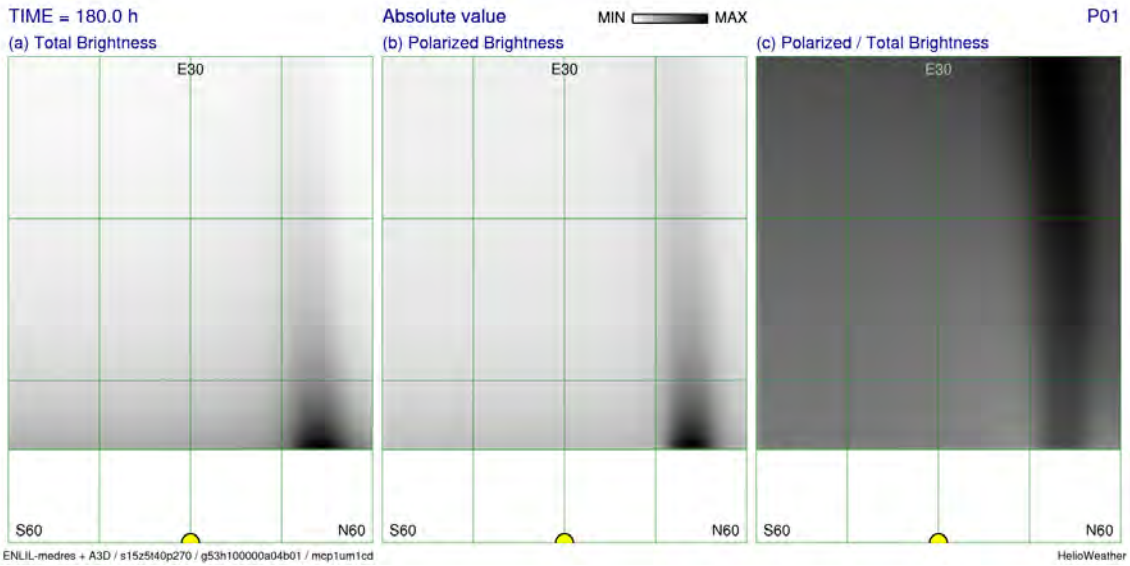


Synthetic Image



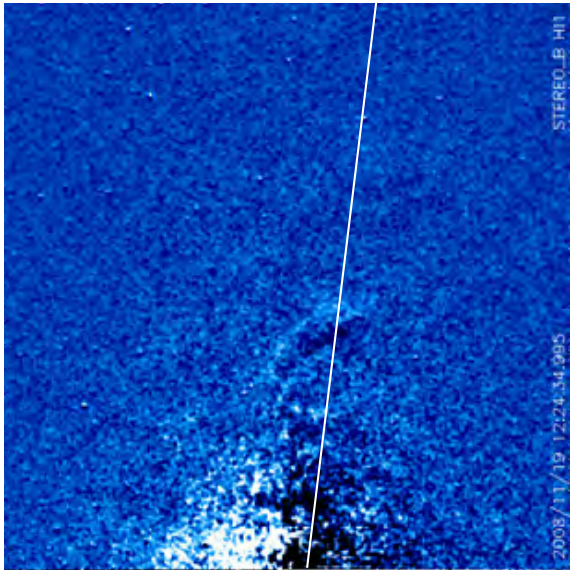
Synthetic Movies

Two movie files can be viewed

- Solar wind from an equatorial circular coronal hole
- Solar wind from a tilted streamer belt

Note: Dark is high brightness; white is low brightness

STEREO Image



2008-11-19 STEREO observation

From:

Tappin & Howard, 2009.

Conclusion

- PUNCH will provide a new observational perspective on CIRS
- Will PUNCH confirm our understanding of CIRS, tweak our understanding, or revolutionize our understanding?